

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Level Control Apparatus for the Filling of Containers with Liquid

I, JACQUES MULLER, a French Citizen, of 123 Avenue du General de Gaulle, La Garanne-Colombes, Seine, France, do hereby declare the invention for which I pray that a Patent may be granted me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to level control apparatus for the filling of containers with liquid, and is particularly applicable to the filling of containers with liquids such as petroleum products which must be handled with some care.

One of the difficulties experienced during the filling of cisterns, tanks or reservoirs with petroleum products, particularly oil fuel reservoirs installed for the heating of buildings, is that of avoiding overflow due to an error of judgement or some other cause which, in addition to the annoyance it produces, may cause serious accidents. For this reason, installations of some size are provided with safety devices, but tanks and reservoirs of less importance are generally not so provided, so that their filling is effected by guesswork.

The present invention accordingly relates to a level control apparatus of simplified design which may easily be fitted to any type of tank or reservoir, whether it is fixed or movable, and which is of comparatively low cost price compared with existing apparatus or devices.

According to the invention, level control apparatus for the filling of cisterns, tanks, reservoirs and other containers comprises a guided float arranged to cause the closure of a liquid-admission flap valve or other shut-off device when the float reaches a predetermined maximum level, the valve or shut off device being so constructed and arranged that pressure of the filling liquid does not tend to open it, the float being also arranged during its movement in one direction or the other to actuate an indicator or graduated disc so as to permit

the height and/or the volume of the liquid introduced into the container to be ascertained.

Some examples of level control apparatus in accordance with the invention are shown in the accompanying drawings, in which:

Figure 1 is a part-sectional view through level control apparatus for tanks or the like which are filled at their upper part;

Figure 2 is a side view of converted level control apparatus adapted to be fitted to tanks and reservoirs the filling of which is effected at their lower part;

Figure 3 is the front view of an automatic shut-off device combined with a draw-off valve device; and

Figure 4 is a part-sectional view through modified apparatus comprising a constant level indicating disc provided with recording chart if necessary.

The level control apparatus shown in Figure 1 comprises a float 1 mounted for sliding movement on a descending filling tube 2. This tube is fitted to a connection 3 secured to a manhole cover 4, or to some other suitable place in the upper part of a tank. The connection 3 may be put into communication with a detachable shut-off device 5 of the transfer piping, either directly or by means of a length of appropriate piping (not shown), and comprises an inner flap valve 6 adapted to be operated from the outside by means of a projecting rod 7. The rod 7 is provided with a contact roller 8 the axle 9 of which engages a sliding indicator 10 passing through the cover 4 and entering a tubular part 11 which is either transparent or has one or more transparent windows.

In its upper part, the float 1 has a stop 12 intended to come into contact with the roller 8 of the valve rod. Guide parts 13 and 14 ensure that the stop 12 is correctly presented to the roller 8.

When the level of liquid in the tank is below a certain level, the valve 6 is open and the rod 7 is in the lower position shown

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in chain lines. The indicator 10 is also in its lower position. The filling operation may then be carried out normally.

As soon as the liquid level approaches the maximum line, the stop 12 of the float comes into contact with the roller 8, causing both the closure of the valve 6 and the ascent of the indicating indicator 10. At this moment flow of the fluid is arrested, and the operator may then close the cock 5 and disconnect the transfer pipe in complete peace of mind. Since the pressure of the filling liquid does not tend to open the valve, shut-off of the liquid is positive and occurs at the same level within the container irrespective of the pressure of the liquid.

In those cases where the tank or other container is filled through its lower part, the level control apparatus can take the form of that shown in Figures 2 and 3. Here the float 1 (Figure 2) is adapted to co-operate with an automatic shut-off device 15 having a rotary disc 16 (Figure 3), the shut-off device being advantageously combined with a draw-off device 17 having a valve 18. This is achieved by mounting the shut-off device 15 and the draw-off device 17 on the ends of two joined-together pipes 20 and 21.

In this particular arrangement the float 1 is connected at its lower part to the lever 22 of the disc 16 of the shut-off device 15 by means of a link 23, which may be a chain or a rod, so that when the float is in its lower position shown in chain lines (where it is limited by a stop 24 appropriately positioned on a guide tube 25) an orifice 27 in the disc 16 lies opposite an orifice 26 in the shut-off device 15 for permitting admission of the fluid. When however the float 1 is in its upper position shown in full lines, the angular position of the disc 16 ensures closure of the shut-off device (as in Figure 3) when the tank is full. This device is, like the flap valve, unaffected by liquid pressure.

As in the preceding example shown in Figure 1, the float has a stop 12 adapted to come into contact with a roller 8 mounted on a rod 28 pivoted to the guide tube 25 for actuating the indicator 10. Guide parts 12 and 13 of the float again ensure correct presentation of the stop 12 to the contact roller 8.

The pipe 21 also permits withdrawal of fluid by automatic opening of the valve 18 when the shut-off device 15 is closed, which is particularly important since admission of fluid causes the valve 18 to close due to its arrangement.

Figure 4 shows a modified form of level control apparatus which comprises a graduated disc 29, provided with a record chart if necessary, enabling the volume of fluid in the tank to be ascertained at any moment. This disc is actuated by a chain 30 (similar to a bicycle chain), one end of which is attached to the

upper part of the float while the other end is fixed to the lower part of the float. The chain passes over a pinion 31 mounted for free rotation on the bottom of the tank and over a pinion 32 integral with a gear-reducing system 33, thereby ensuring rotation of the graduated disc 29 during descent of the float 1.

As in the first example shown in Figure 1, this device includes an automatic flap valve 6 for shutting off the transfer of liquid, the valve being operated by the stop 12 actuating the contact roller 8 and the rod 7.

WHAT I CLAIM IS:—

1. Level control apparatus for the filling of cisterns, tanks, reservoirs and other containers with liquid, the apparatus being designed for location in the interior of the container, in which a guided float is arranged to cause the closure of a liquid-admission flap valve or other shut-off device when the float reaches a predetermined maximum level, the valve or shut-off device being so constructed and arranged that pressure of the filling liquid does not tend to open it, and the float being arranged during its movement in one direction or the other to actuate an indicator or graduated disc so as to permit the height and/or the volume of the liquid introduced into the container to be ascertained.

2. Level control apparatus according to claim 1, in which the float is arranged to slide on a descending filling tube or on a guide tube.

3. Level control apparatus according to claim 2, in which the descending filling tube is provided in its upper part with a connection wherein there is arranged a pivoting flap valve secured to a projecting rod having an axle on which is mounted a contact roller.

4. Level control apparatus according to claim 3, in which the axle of the contact roller engages with an indicator passing through the upper wall of the container into a tubular part which is transparent or is provided with one or more windows.

5. Level control apparatus according to claim 3 or claim 4, in which the float is provided at its upper part with a stop intended to come into contact with the roller on the rod of the flap valve.

6. Level control apparatus according to claim 5, in which guide parts for the float ensure good presentation of the stop to the contact roller on the rod of the flap valve.

7. Level control apparatus according to claim 1, in which the lower part of the float is connected by a link to a disc shut-off device for shutting off the admission of liquid, the disc shut-off device being designed for location in the bottom of the container.

8. Level control apparatus according to claim 7, in which the float is limited in its descent by a stop arranged on a guide tube

or on some other suitable part of the apparatus.

5 9. Level control apparatus according to claim 7 or claim 8, in which the liquid admission disc shut-off device is combined with a draw-off valve device, the two devices being connected to the same double service pipe.

10 10. Level control apparatus according to any preceding claim having a graduated disc actuated by the movement of the float in one direction or the other by means of a chain acting through a gear reduction system, the

two ends of the chain being secured to the float and passing over pinions.

11. Level control apparatus for the filling of cisterns, tanks, reservoirs and other containers substantially as described with reference to Figure 1, Figures 2 and 3, or Figure 4 of the accompanying drawings.

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Fig. 1.

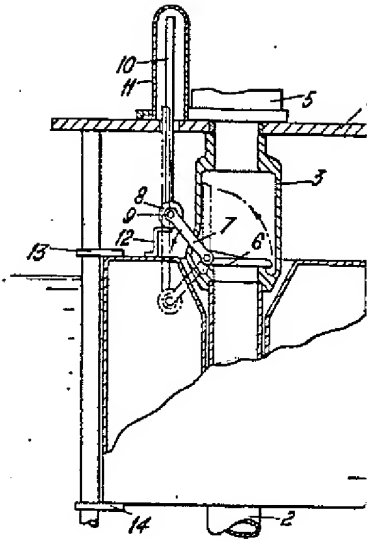


Fig. 2.

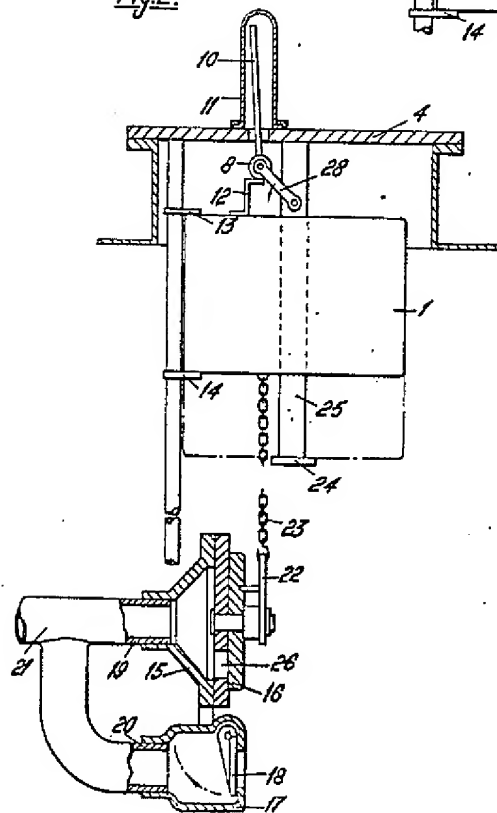
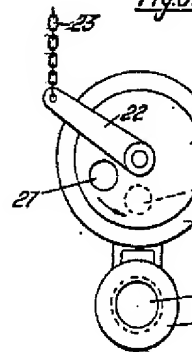


Fig. 3.



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2 SHEETS This drawing is a reproduction of
the Original on a reduced scale
Sheets 1 & 2

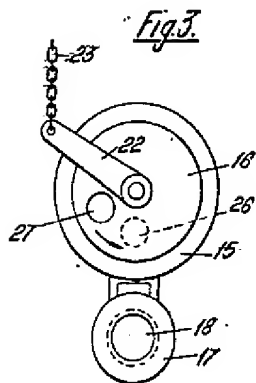
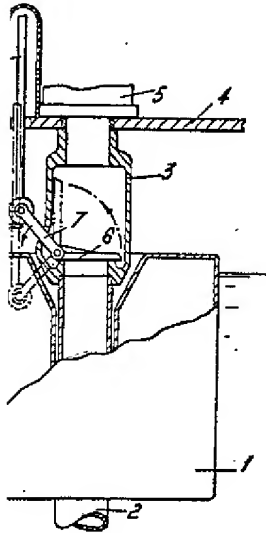


Fig. 4.

